A.D. 1845 . . . . N° 10,452.

SPECIFICATION

OF

JAMES HORNE.

INJECTING INSTRUMENTS, &c.

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HORNE'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, James Horne, of Clapham Common, in the County of Surrey, Esquire, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Second day of January, in the eighth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said James Horne, my ex̃ors, adm̃ors, or assigns, Her especial licence, full power, sole privilege and authority, that I, the said James Horne, my ex̃ors, adm̃ors, and assigns, and such others as I, the said James Horne, my ex̃ors, adm̃ors, or assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, my Invention of "Certain Improvements in Injecting Instruments, which are also applicable to various Pneumatic Purposes;" in which said Letters Patent there is contained a proviso that I, the said James Horne, shall cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, under my hand and seal, to be enrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said James Horne, do hereby declare that the nature of my said Invention, and in what manner the same is to be performed, are fully ascertained and described in and by the present Specification thereof, reference being had to the Drawings hereunto annexed (that is to say):—

Figure 1 of the said Drawings is an external elevation, and Figure 2 a sectional elevation of an air pump of an improved construction, applicable to such injecting instruments as enemas and others, which may be made to operate by the pressure of air on the fluids injected. A is the barrel of the pump *a*, the cap having two air holes in it *b*, *b*, and C, the bottom, which are respectively screwed to the body piece in manner shewn. B is the piston which has a hollow rod *c*, open both at top and bottom. C^2 is a conical valve inserted in the centre of the bottom piece E, an external elevation and section of which valve are given separately on an enlarged scale in Figures 3 and 4. *d*, the spindle of this valve, consists of a short tube which is at top exactly under the lower termination of the hollow rod *c* of the piston rod, and has at bottom two or more ports *e*. *f* is a spiral spring which is coiled round the spindle *d*, and *g* a collar which is screwed upon the top of the spindle, and keeps down the spring *f* in its place. In working this pump the piston is first drawn to the top, when the air in the upper portion of the barrel is expelled through the air holes *b*, *b*, in the cap, and the lower portion is filled with air through the hollow piston rod *c*. The rod *c* is then closed at top by the thumb, and the piston pressed down, which causes the air in the under portion of the barrel to press on the valve C^2 till it is pushed out sufficiently far to allow of the air which escapes through the ports *e* of the valve spindle passing off round the sides of the valve. On the air being expelled from the pump, the resilient action of the spring *f* immediately restores the valve to its place.

Another improved form of air pump, also applicable to the same class of injecting instruments as that before described, as represented in a portion of Figure 5. A is the barrel, which in this case has no air holes at the top, but is provided at bottom with a valve C^2, exactly similar to that of the pump first before described. B is the piston, the framework of the body of which consists of two pieces *k* and *l* screwed into one another. The rod *c*, instead of passing as usual quite through the body part, terminates in the upper half *k*, and into the bottom of the lower part *l* there is screwed a valve piece B^2 similar in all respects to that which forms the bottom of the barrel, except that it is smaller. The rod works through a stuffing box at top, and is solid throughout the greater part of its length, but has a hollow space *m* at top, with two sets of side ports in it *p* and *q*, and also terminates at bottom in a hollow part *n*, with side ports *r*, *r*, the open bottom of the rod and the top of the spindle in the valve piece B^2 facing one another. The operation of this form of pump is as follows:—As the piston is drawn to the top the air in the upper portion of the barrel escapes into the hollow part *n* of the lower end of the piston through the ports *r*, *r*, and, passing thence into the hollow spindle of the valve piece B^2, presses down the valve C^2, when it flows through the ports of the spindle and round the sides of the valve into the portion of the barrel under the piston. On now pressing down the piston the air is expelled through the valve C^2 in the bottom of the barrel, and continues to be so till, by the descent of the piston, the ports *q*, *q*, at the bottom of the hollow part *m* in the top of the piston opens into the upper portion of the barrel, when it is immediately filled by the rushing in of the external atmosphere through the ports *p*, *p*, and *q*, *q*.

Either of the two forms of air pump which have been described may be applied with advantage to injecting instruments. Figure 5, in its entirety, represents an instrument of this kind, with the second form of pump applied to it, and the whole in a state ready for use. S is an external case. The pump, as before described, is inserted through an orifice in the top of the case S, and made fast by screwing the top of the barrel into the orifice. T is a second orifice in the top of the case, with a cap to fit, through which the case is filled to any convenient height with the water or other fluid to be injected. V is the injecting pipe, which is screwed into the bottom of the case S, and consists of four pieces, 1, 2, 3, and 4. The pieces 1 and 3 are made of brass or other metal, the piece 2 of caoutchouc tubing, and the piece 4 of ivory. The piece 4 is connected to 3 by a knuckle screw joint, which enables it to be turned up to a right angle with the rest of the pipe, and the piece 2, being of a flexible quality, allows the rest of the pipe to be also bent from the horizontal line to any extent likely to be found requisite. W is a cork attached to the piece 1 for the purpose of opening or closing the pipe as required. The case having been filled, and the cap T screwed down, the cork W is opened in order to admit water into the injecting pipe, and so to free it from air before commencing the process of injection. The apparatus being now ready for use, the pipe is introduced, and the pump worked by the hand, when the air expelled from the pump ascends to the top of the water in the case S, and by its pressure on the fluid causes a continuous stream to flow out of the injecting pipe. On finishing the operation care must be taken to close the cock W before withdrawing the pipe.

The advantages attending the mode of construction and operation just described, (whether an air pump of the first or second kind described is employed), are:—First, that the valve or valves of the air pump are of so simple a construction that no length of use can materially impair their efficiency, and that as no fluid passes through the pump no clogging or corrosion of its parts can ever take place from that source, so that from both causes the pump continues at all times clean and fit for immediate use; second, that no air can be thrown forward either at the beginning or during any part of the operation, whereby a frequent cause of complaint, and even of serious injury, where injecting instruments are used, is wholly avoided; third, that the fluid is injected in a gentle yet continuous and well sustained stream, with no more than the exact amount of force required, and that it may cease to be injected the instant its application ceases to be pleasant or useful; and, fourth, that none of the fluid can escape from the apparatus except through the injecting pipe. When the instrument is not in use, it is packed up in the manner represented in Figure 6. The case S is first emptied of the water or other fluid through the orifice T. The pump is then unscrewed and dropped through the orifice T into a circular stand X fixed for its reception in the bottom of the case. The injecting pipe is next taken off and made into two lengths by unscrewing the piece 3 from the piece 2, and these lengths are dropped through the orifice in the top of the case previously occupied by the pump into a second stand Y fixed in the bottom of the case. The two orifices being now closed, that marked T with the cap proper to it, and the other with a cap Z kept for the purpose, the top of the case exhibits the appearance represented in Figure 7. The case S, instead of being oval, as represented in Figures 5, 6, and 7, may be made circular with a single opening in the top, having a double screw cap to fit, as shewn in Figure 8. In both the air pumps before described valves are employed, but in Figure 9 I have shewn a form of construction where no valves whatever are made use of, and which may also be applied with advantage to injecting instruments. A is the barrel, B is the piston, C the rod, which works through stuffing boxes at top and bottom, and slides to and fro through the body part to the extent of the space between the two steps *a* and *b*. It is hollow throughout with the exception of a diaphragm inserted at *d*, and is closed at both ends, but has side ports at the different points 1, 2, 3, 4, 5. On the piston rod being drawn towards the top, and through the body part of the piston, as soon as the ports 3 open into the upper portion of the barrel, the air passes into the under portion of the barrel through the ports 3 and 5. On the piston rod being then pushed down, the ports 3 become closed by the body part of the piston, as shewn in the Drawings, and the air beneath the piston is pressed forward and condensed till the ports 5 emerge from the stuffing box in the bottom of the barrel, when the air escapes through them (to act on the fluid of an injecting instrument, as before described, or in any other way required), while at the same instant the ports 2, 2, at the top, being brought by the same descent of the piston within the upper portion of the barrel, admit into it a fresh supply of air from ports 1, 1. By applying a handle to the lower end of the piston rod, and reversing the position of the instrument, it becomes an exhausting apparatus possessed of great power, and wholly free from the inconveniences which attend the use of such instruments when they are dependant on valves for their efficiency.

For pneumatic purposes generally all the three pumps before described will be found eminently useful, but more especially when high degrees of exhaustion or condensation are required.

And having now described the nature of my said Invention, and in what manner the same is to be performed, I declare that what I claim as of my Invention is,—

First, the making of injecting instruments, such as enemas and others, with an air pump having a piston rod and valve of the peculiar form represented in Figures 1 and 2, and before described.

Second, the making of injecting instruments with an air pump having a piston and valves of the peculiar forms represented in Figure 5, and before described.

Third, the making of injecting instruments with an air pump having no valves, and a piston and piston rod of the peculiar forms represented in Figure 9, and before described.

Fourth, the employment for pneumatic purposes generally of the air pumps possessing the peculiarities before described and claimed. And,

Fifth, the employment for pneumatic purposes generally of the form of valve particularly represented in Figures 3 and 4.

In witness whereof, I, the said James Horne, have hereunto set my hand and seal, this Twenty-third day of January, in the year of our Lord One thousand eight hundred and forty-five.

JA^{S} (L.S.) HORNE.

BROUGHAM.

AND BE IT REMEMBERED, that on the Twenty-third day of January, in the year of our Lord 1845, the aforesaid James Horne came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Enrolled the First day of March, in the year of our Lord One thousand eight hundred and forty-five.

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ORNE'S SPECIFICATION.

(1 SHEET)

FIG. 1.

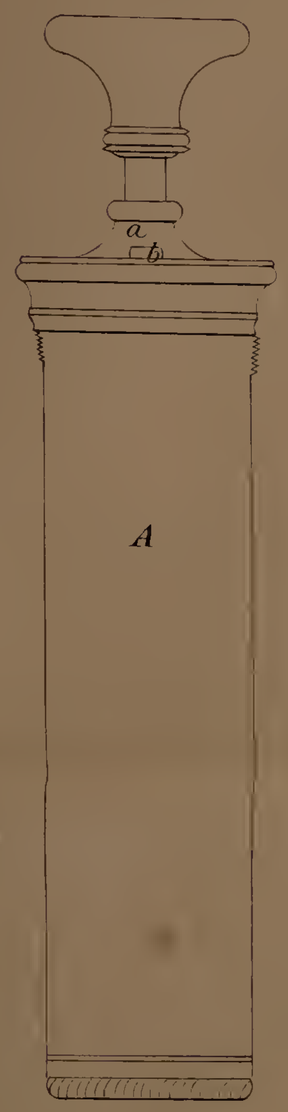


FIG. 2.

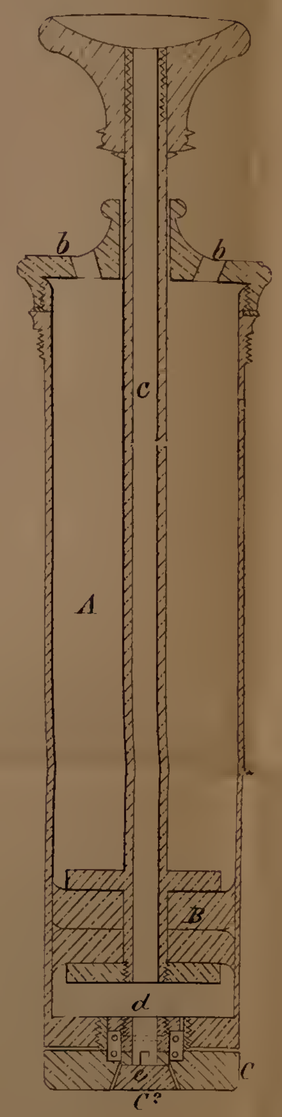
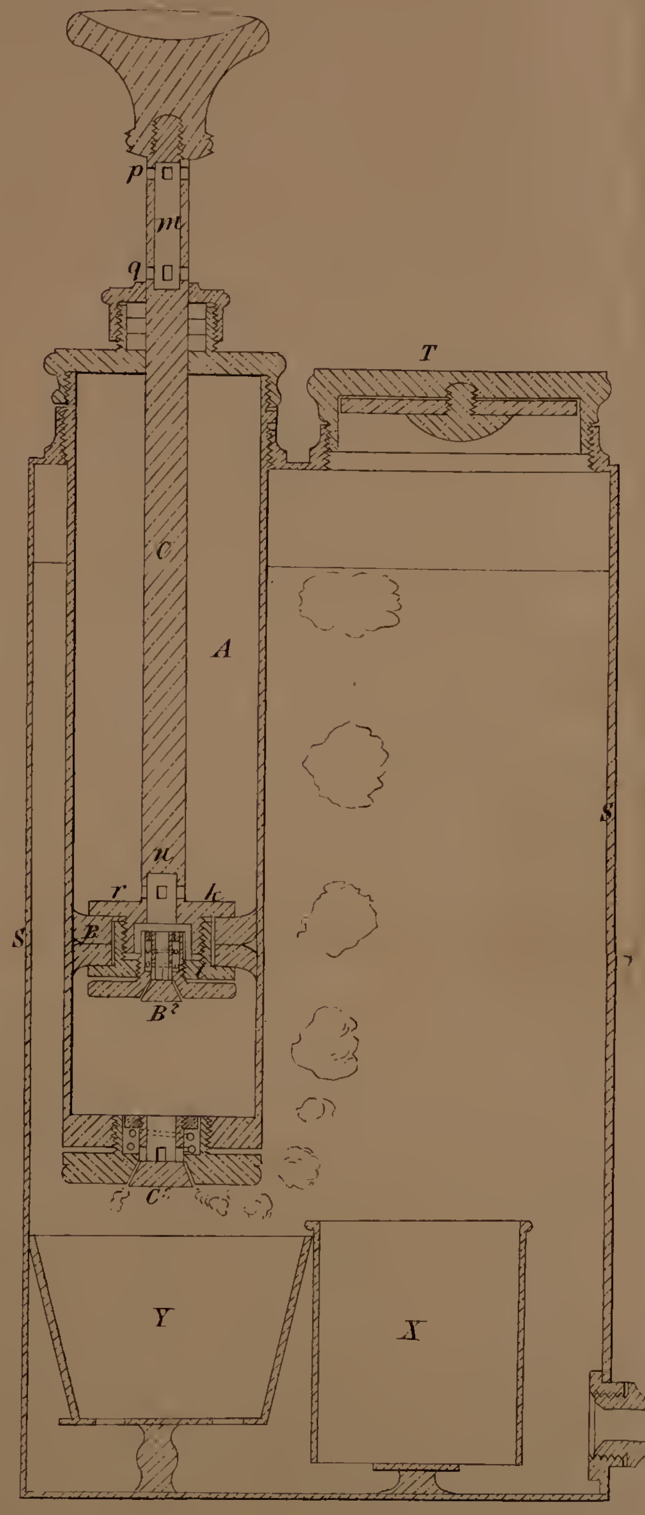
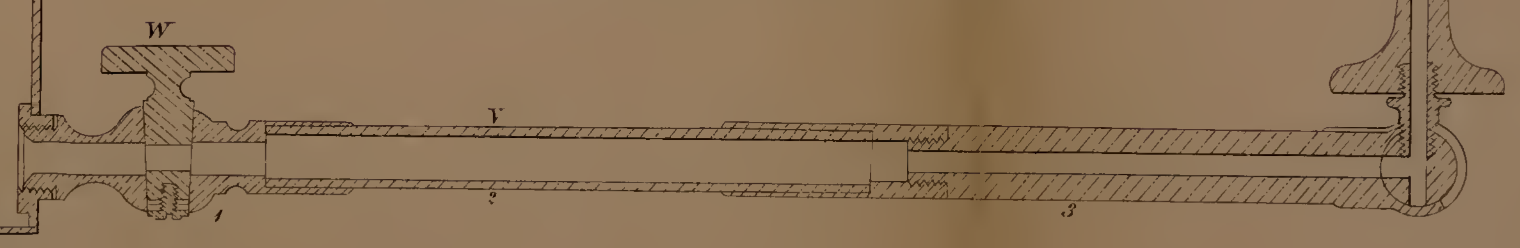


FIG. 5.





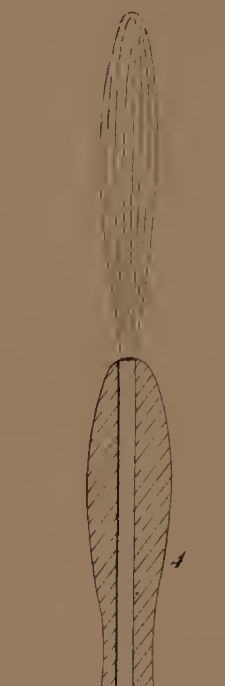


FIG. 6.

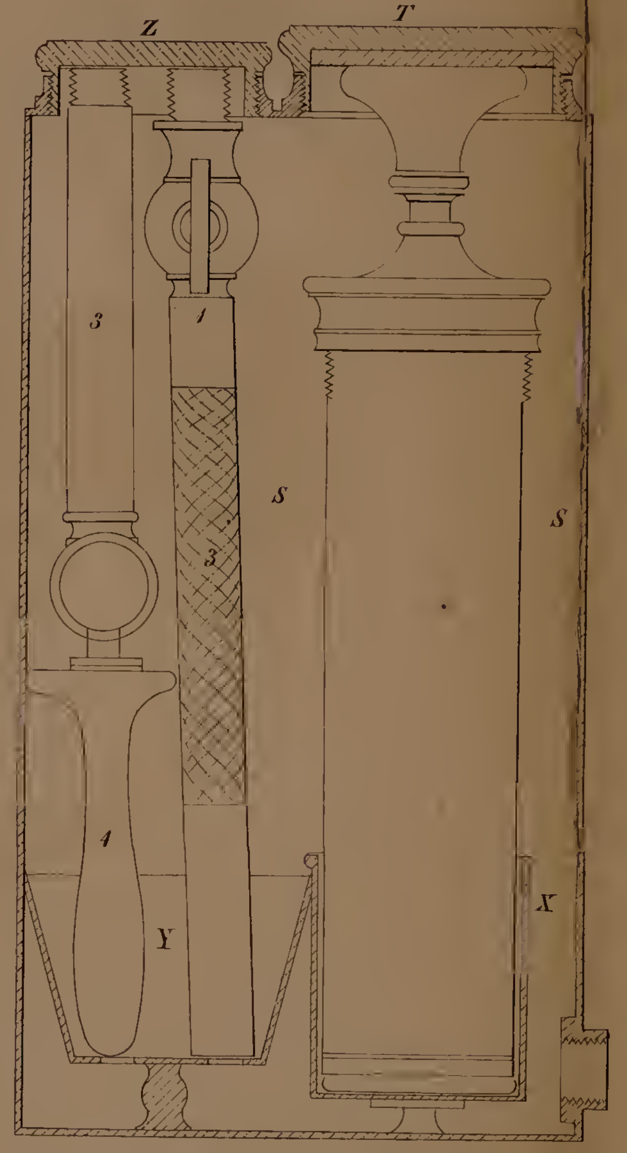


FIG. 9.

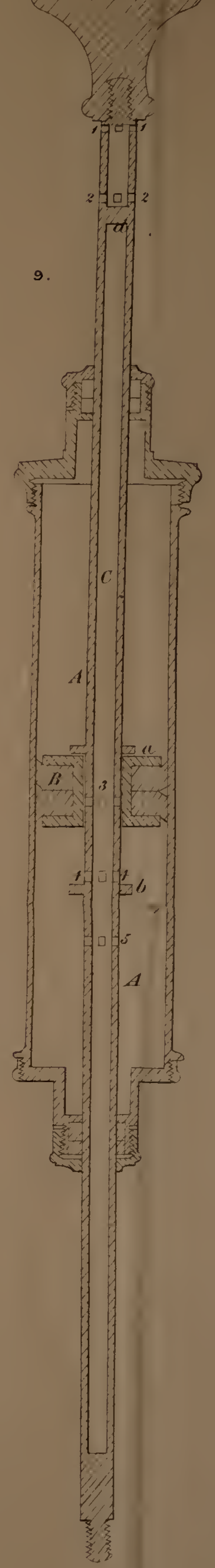


FIG. 4.

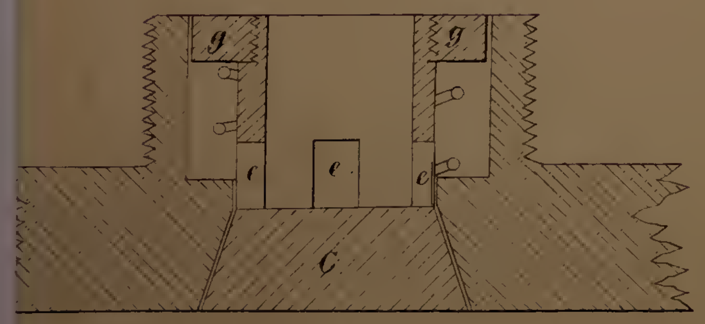


FIG. 3.

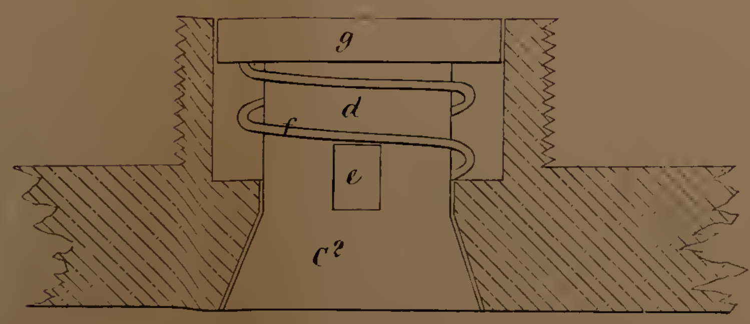


FIG. 8.

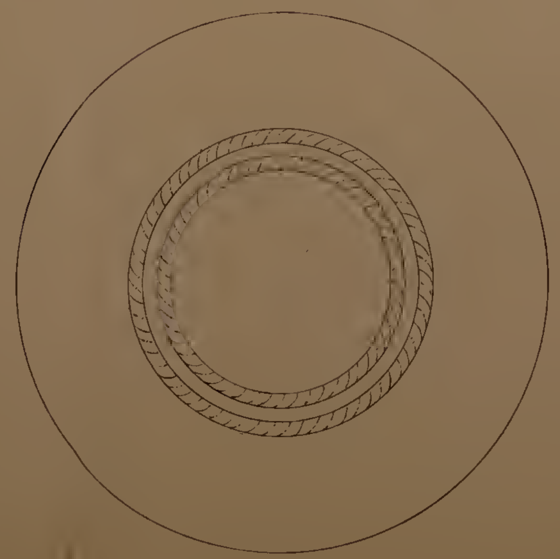
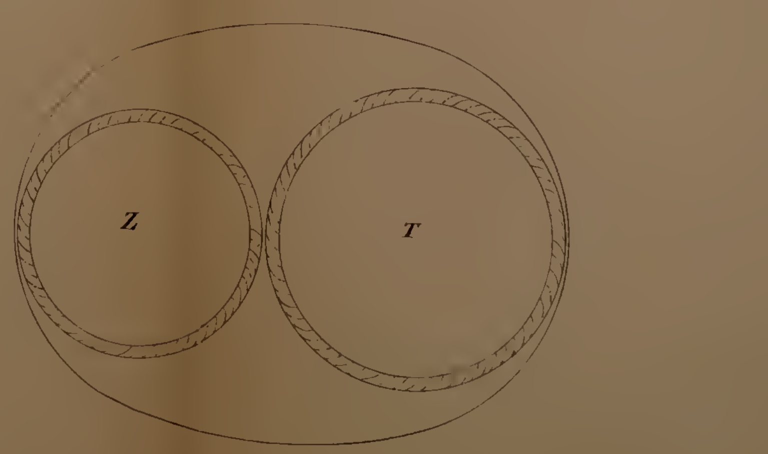


FIG. 7.



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